

“In the dusky Moonlight, by the flickering fire,
listening to the whispering leaves, that never seem to tire”



MEET THE DECATHLETES





1912

Girl Scouts of USA begins



1920

Camp Archbald opens

1926

Jane Jacobs attends Camp



1938

GSA's 1st Floating Cabin

2018

Camp Archbald threatened with closure



FALL 2022

Glacier Jane Begins

FALL 2023

Patch Program Begins



SUMMER 2024

Glacier Jane Built



JANE JACOBS



PROJECT TIMELINE

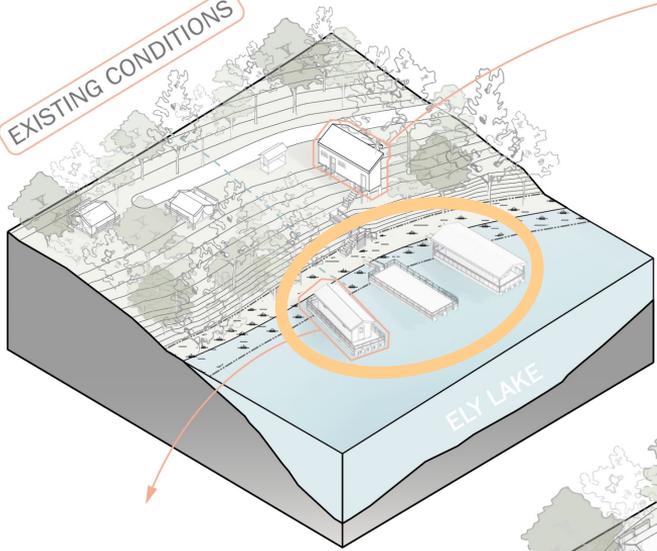
1912 - 2024

GIRL SCOUT LAW

To be considerate & caring, responsible for what I say and do, use resources wisely, and make the world a better place



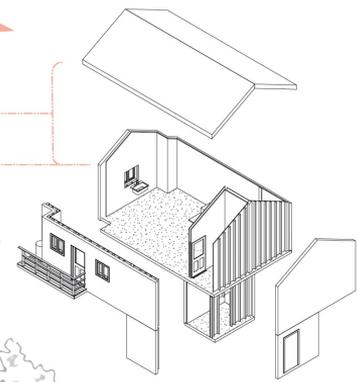
EXISTING CONDITIONS



Reclaimable Materials



Reusable Assemblies



ARCHITECTURE



80%

DESIGN GOALS

MATERIAL REUSE

HABITAT

- Water Quality Improvements
- Shadow Reduction
- Smart Lighting

ACCESS

- Girl Scouts
- All Ages & Abilities
- Off-Season Renters

EDUCATION

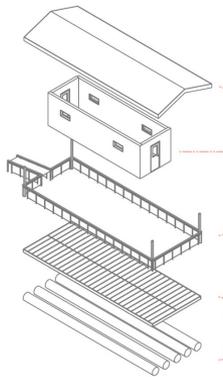
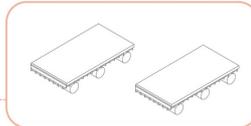
- Immersive water research
- Interaction with passive solar design elements and active environmental control systems



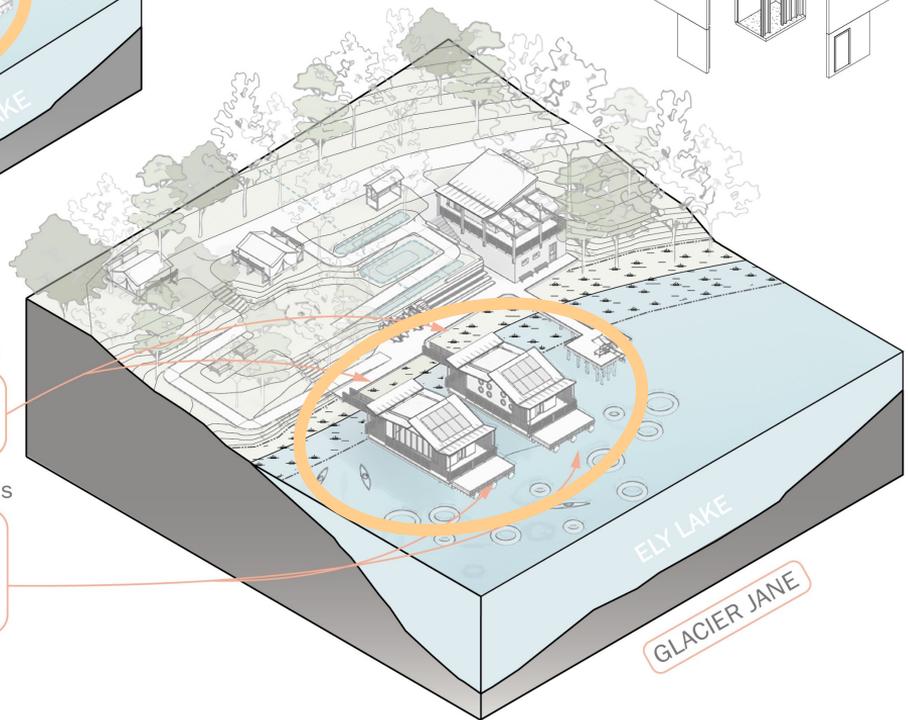
Reclaimable Materials



New Pontoon Extensions



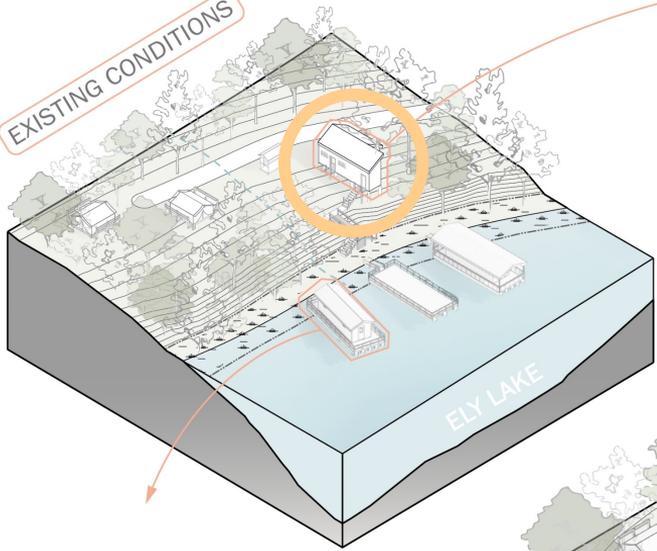
2nd EXISTING CABIN



GLACIER JANE



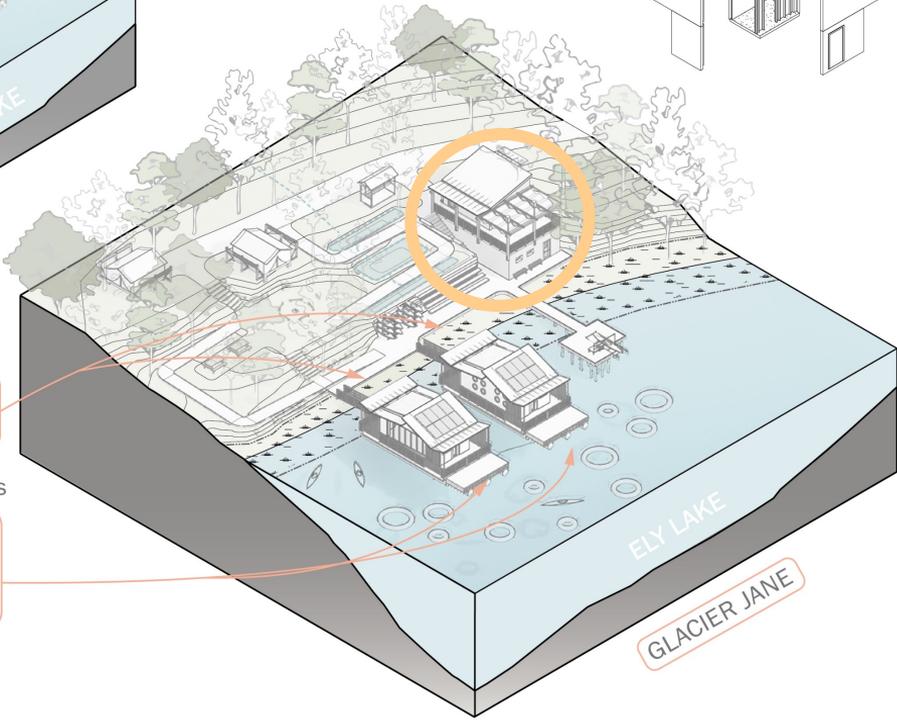
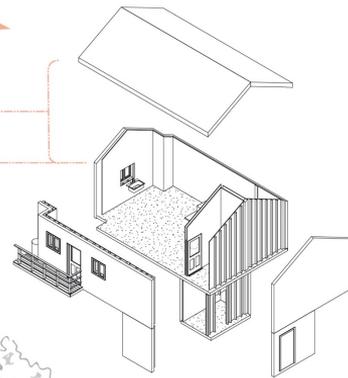
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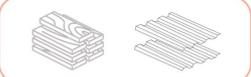
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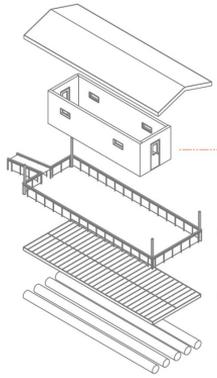
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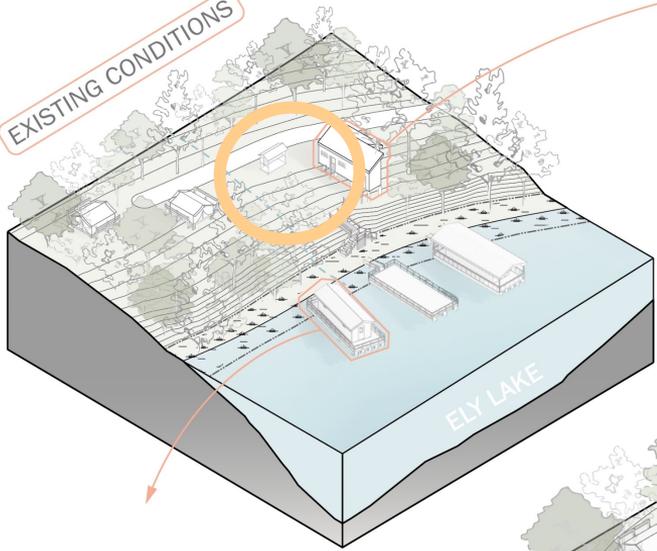
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4

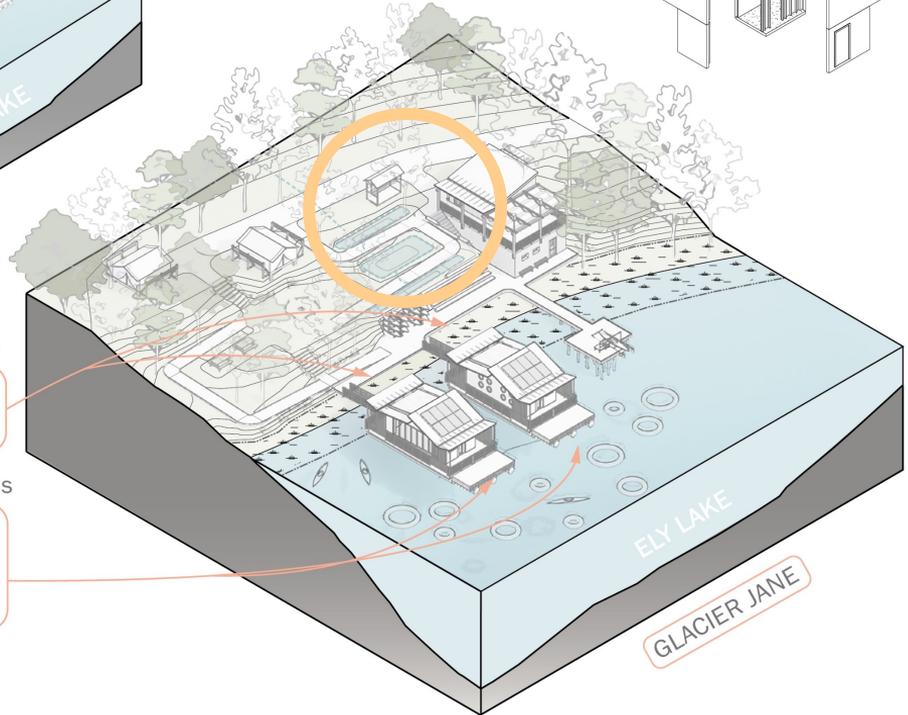
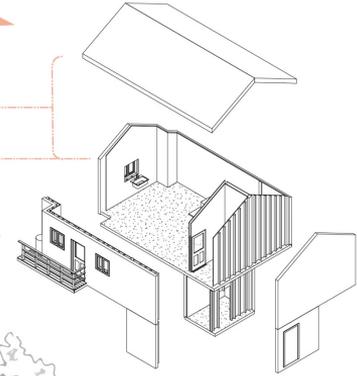
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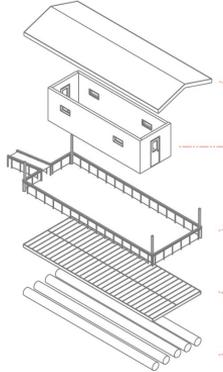
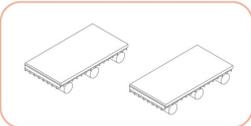
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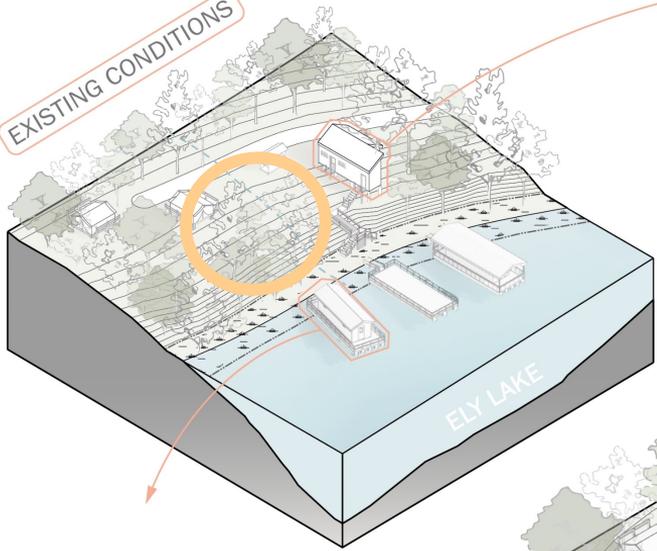
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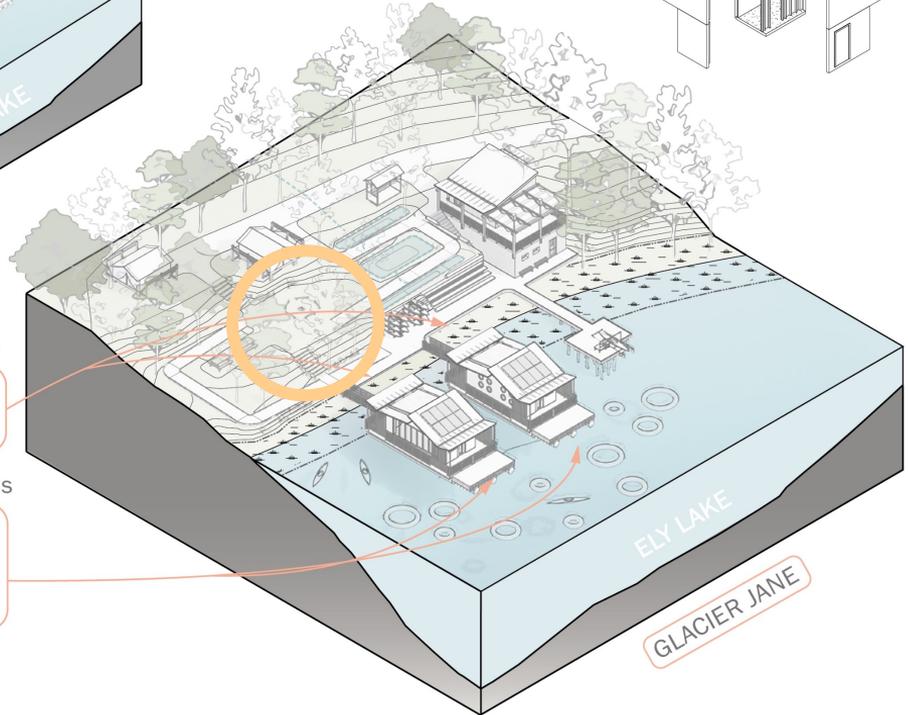
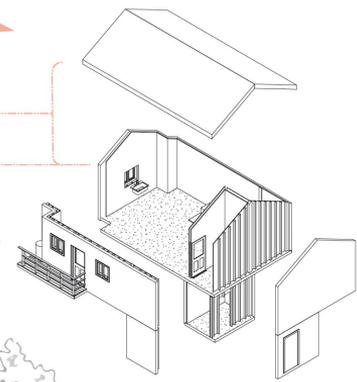
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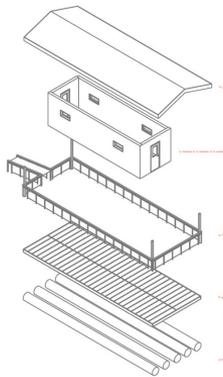
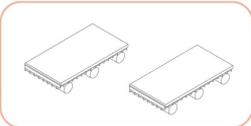


GLACIER JANE

Reclaimable Materials



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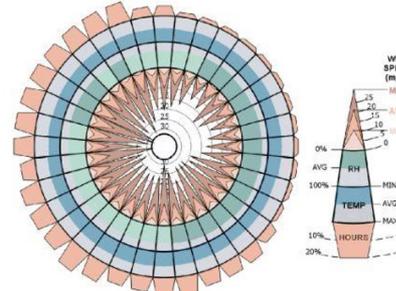
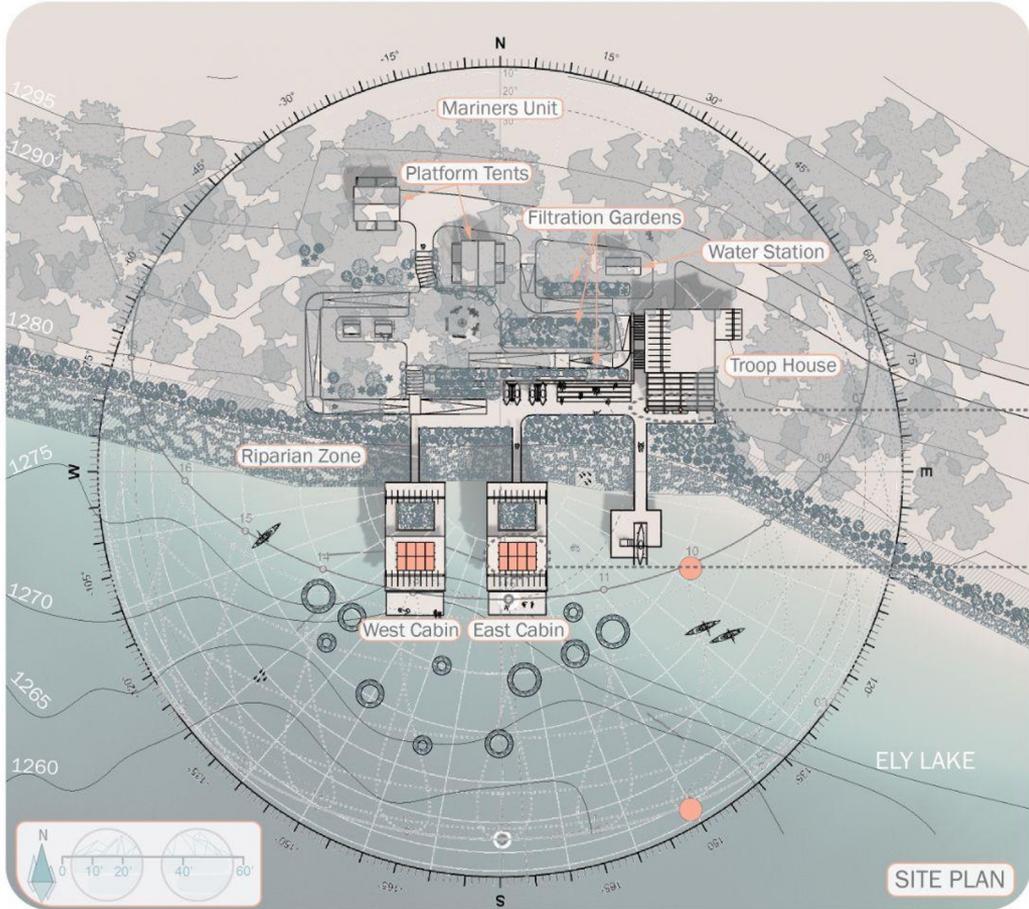
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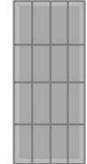




BROOKLYN TOWNSHIP WIND



WIND TURBINES
Amount Generated:
26,208 kW per year



SOLAR PANELS
Amount Generated:
10,079 kW per year

ARCHITECTURE



2500 Hrs

ANNUAL SOLAR ILLUMINATION

10 mph

WIND VELOCITY AVERAGE

ENERGY PRODUCTION

- Wind Turbines
- Solar Panels

PASSIVE SYSTEMS

- Daylighting
- Cross Breeze
- Operable Stack
- Winterizing Panels

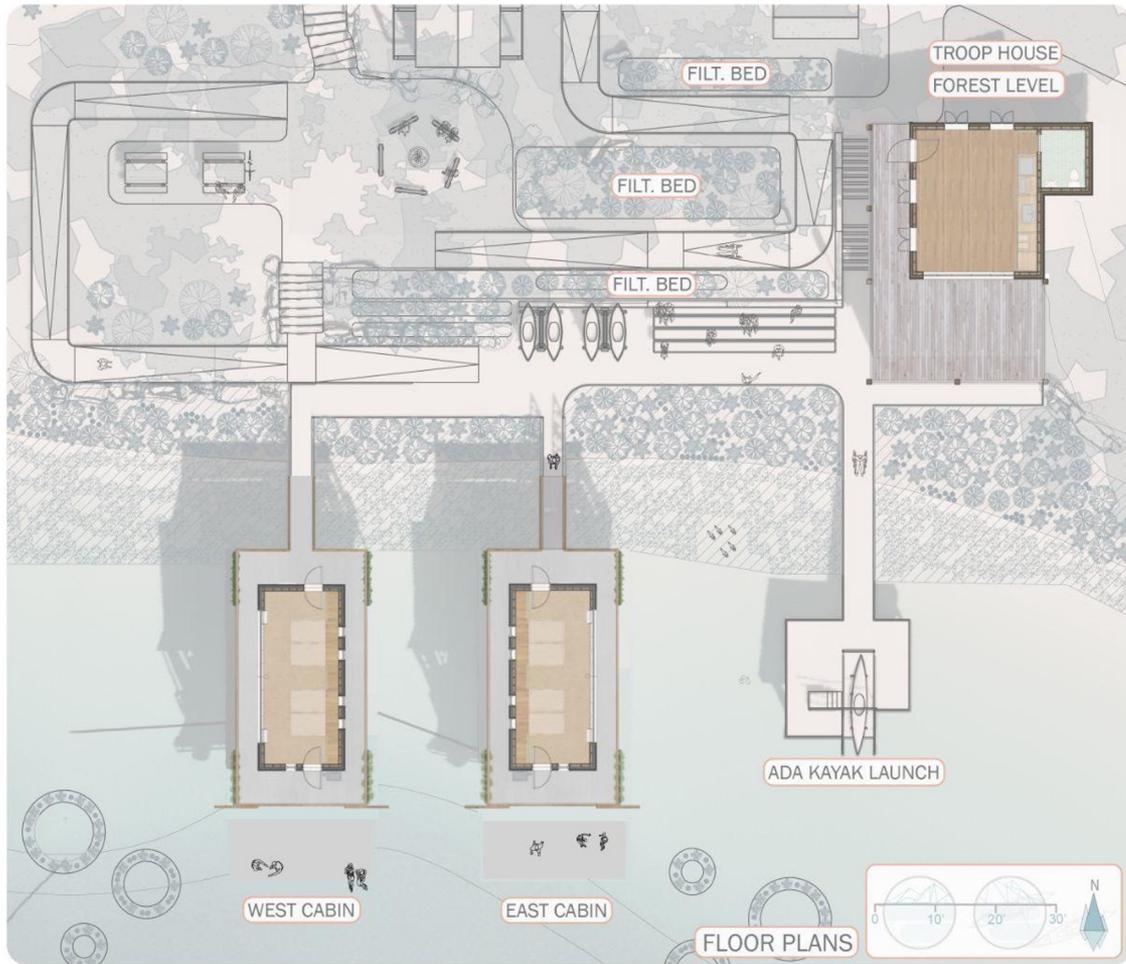


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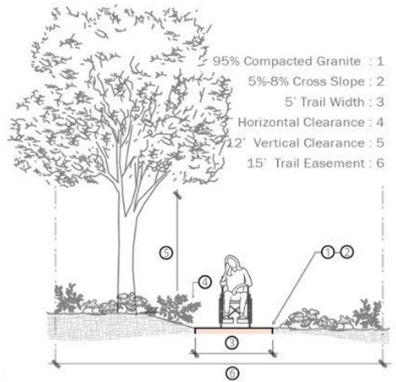


6

MARINERS UNIT



DOCK LEVEL



ARCHITECTURE



FLOOR PLANS

PATHWAY SLOPE

ADA ACCESSIBILITY

- Kayak Launch
- Pathways
- Bathrooms + Showers

RETROFIT IMPROVEMENTS

- Floating Cabins
- Troop House
- Floating Gardens
- Vegetative Water Filters

EDUCATION

- Energy Efficiency Displays
- Hydroponic Gardens
- Water Recycling
- Passive Heating + Cooling
- Living Lab Cabinet Wall
- Geothermal Loops





SECTION THROUGH CABIN LOOKING NORTH



ARCHITECTURE



6A



IECC CLIMATE ZONE



COLD+DAMP WINTER
&
HOT+HUMID SUMMER

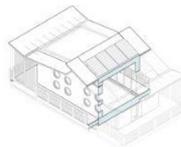


- Introduce air temp. regulation to create conditioned spaces



INTERACTIVE DESIGN

- Versatile and Accessible
- Reused + Repurposed Materials
- Low maintenance, low failure, user friendly, inherently educational





SECTION THROUGH CABIN LOOKING EAST

ENGINEERING



2500%



INSULATION INCREASE



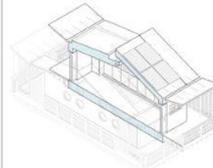
INSULATION TYPES

- Rockwool
- Local Sheep Wool
- SIPs
- Mycelium

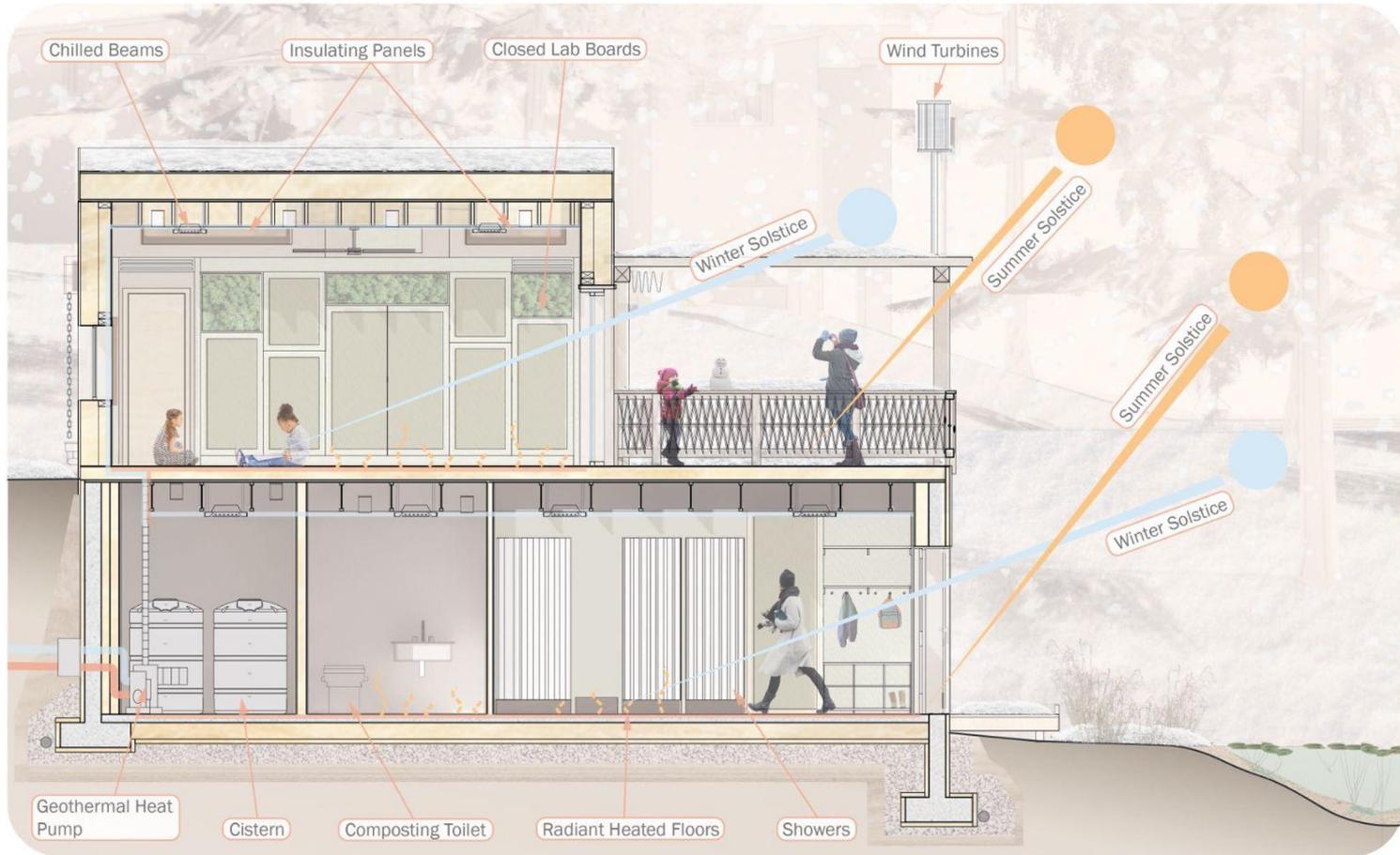


ACCESSORY INSULATION

- Roof Garden
- Cabinet Mass Wall
- Shutters
- Nana Wall



GLACIER JANE



SECTION THROUGH TROOP HOUSE LOOKING EAST



ENGINEERING



0%



ONSITE FOSSIL FUEL



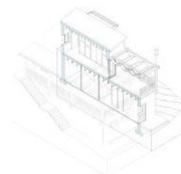
CONTROL LAYERS

- Thermal
- Air
- Bulk Moisture
- Moisture Vapor
- Rockwool Foundation barrier

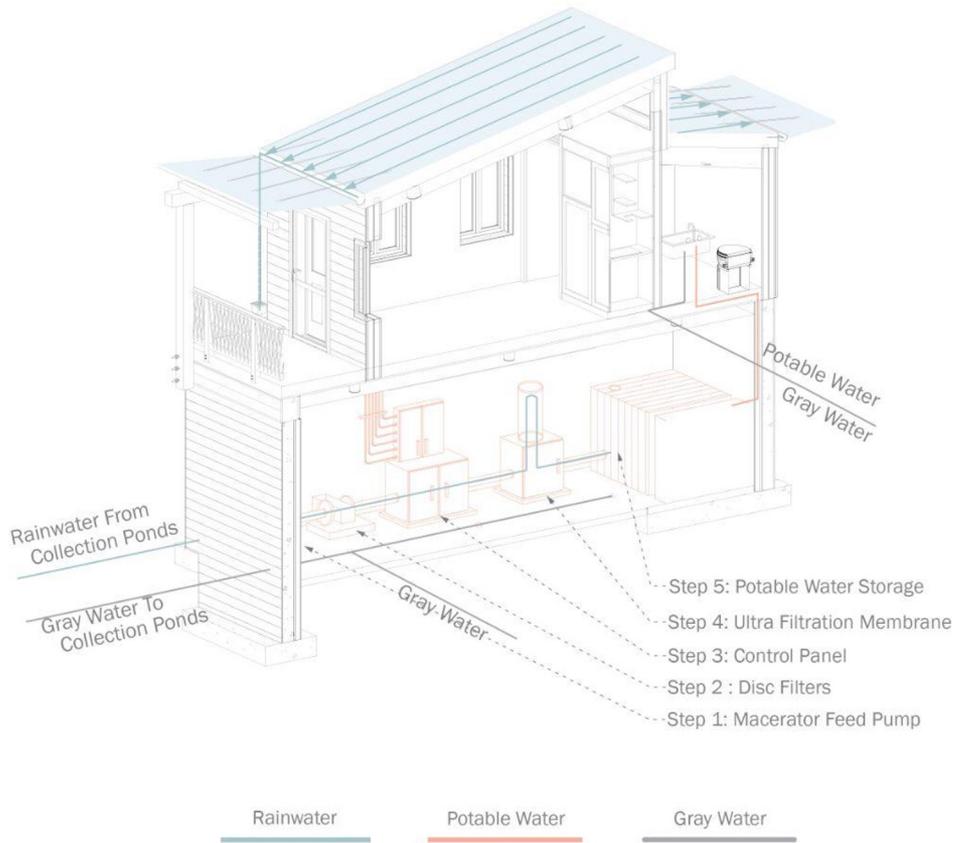


PHIUS+

- Carbon Neutral Construction
- Renewable Energy
- Grid Independent



10



WATER COLLECTION & REUSE



Macerator Feed Pump

Provides controlled supply of water throughout the filtration process - zero air pockets, dry zones



Disc Filters

Extraction of finer particles found in gray water: algae, moss, bacteria, sand, sludge, and other organic materials > 20 microns



Control Panel

Controls, monitors, and maintains every component of the filtration process



Ultra Filtration Membrane

Hollow-Fiber membrane provides a mechanical-foam disinfectant, for waterborne viruses and diseases



Potable Water Storage

2- 500 gallon storage tank collects the water before the gray water process

Active Systems

4,160 kW per year needed from renewable sources

- Macerator Pump
- Control Panel
- ERV

Passive Systems

Saves 6,240 kW per year

- Disc Filters
- Ultra Filtration Membrane
- Potable Storage Tank
- Composting Toilets

ENGINEERING

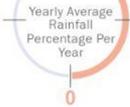


WATER RECOVERY

100%

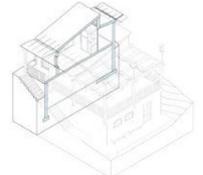
GRAY WATER COLLECTION

50%



0

- Recycles 100% of our waste water within the building,
- Can potentially harvest 6,988 gallons of water per-year



\$1,275,850.84

Retrofit Cost

\$325,283.61 (x2) Floating Cabins
 \$227,838.03 Troop House
 \$397,445.58 Hillside/ADA Dock

EXPENSES

- \$3,500/yr

Maintenance & Repair

- \$63,792/yr

Monthly Mortgage @ 0%
for 20 years
(501(c)(3) business loan)

- \$0/yr

Utility Costs
(After Renewables)

- \$67,292/yr

Yearly Costs

INCOME

+ \$15,000

Income from GS Mariner's Unit
each year

+ \$252,000

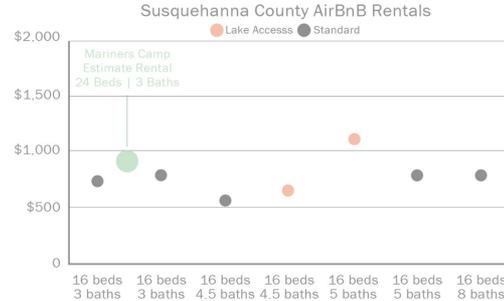
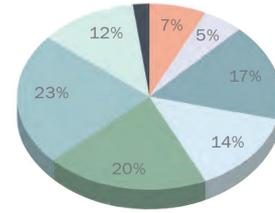
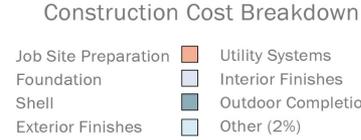
PROJECTED RENTAL INCOME
@ \$900/night
\$6300/wk, 40 weeks/yr

+ \$7,500

Solar PV Direct Pay Credit
(For 501(c)(3) members)

- \$67,292/yr + \$274,500

Yearly Income
(Projected)



= \$207,208

PROFITS TO ASSIST WITH:
 -Deferred Maintenance
 -Camper Subsidies
 -Additional Personnel

MARKETING ANALYSIS

74%

RENTAL USAGE INCREASE

INITIAL COST

- Construction %

EXPENSES + INCOME

- Rental Increases
 - Winterization
 - ADA Access

\$207K PROFIT/YEAR

- Benefits

YEARLY RENTAL

- Opportunity from 2 weeks to 42 weeks



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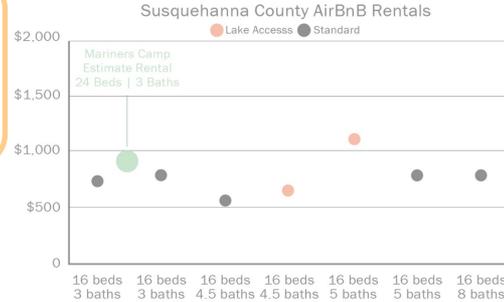
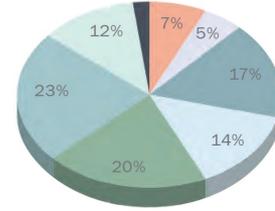
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Construction Cost Breakdown

Job Site Preparation	Utility Systems	
Foundation	Interior Finishes	
Shell	Outdoor Completion	
Exterior Finishes	Other (2%)	



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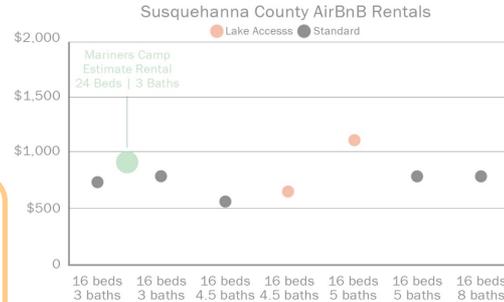
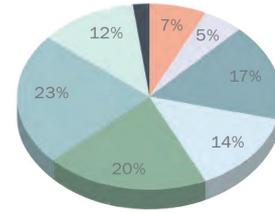
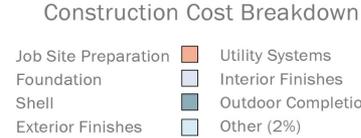
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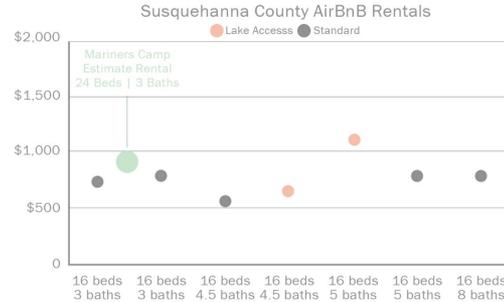
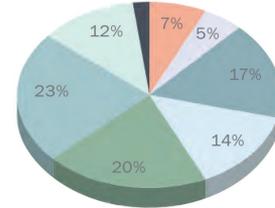
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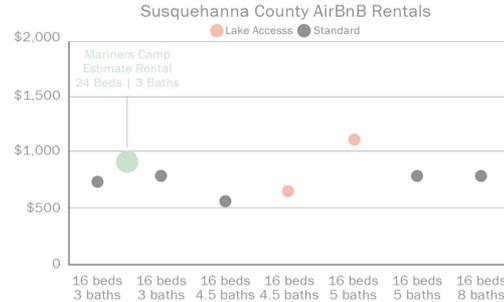
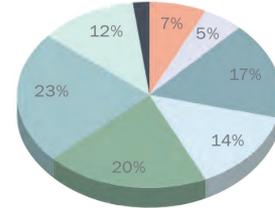
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PERFORATED METAL EDGE
 VEGETATIVE MATS
 GROWING MEDIUM
 WATER RETENTION FLEECE
 DRAINAGE MAT
 ROOT BARRIER
 WATER PROOFING MEMBRANE

R-60 Roof Assembly

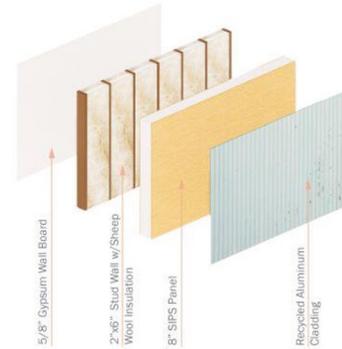
ALUMINUM ROOF FINISH
 1' AIR GAP W/1x4 BATTENS
 4 5/8 GPS (GRAPHITE ENHANCED POLYSTYRENE)
 SIP PANEL
 10" ROCKWOOL BATT INSULATION
 INT. ROOF FINISH - LIGHT WOOD PANEL

R-52 Wall Assembly

REFURBISHED ALUMINUM
 CLADDING
 VAPOR CONTROL LAYER
 GPS SIP PANEL
 1" AIR GAP
 4" ROCKWOOL BATT
 INSULATION
 1/2" WALL FINISH

R-80 Floor Assembly

1/2" FLOOR FINISH
 6 1/2" GPS SIP PANEL
 1" AIR GAP
 10" ROCKWOOL BATT INSULATION
 1" AIR GAP
 2" FIBERGLASS



WALL SECTION FLOATING CABIN

DURABILITY & RESILIENCE

2500%

INSULATION INCREASE

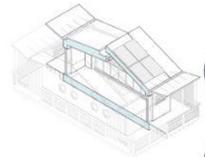
INSULATION VALUES

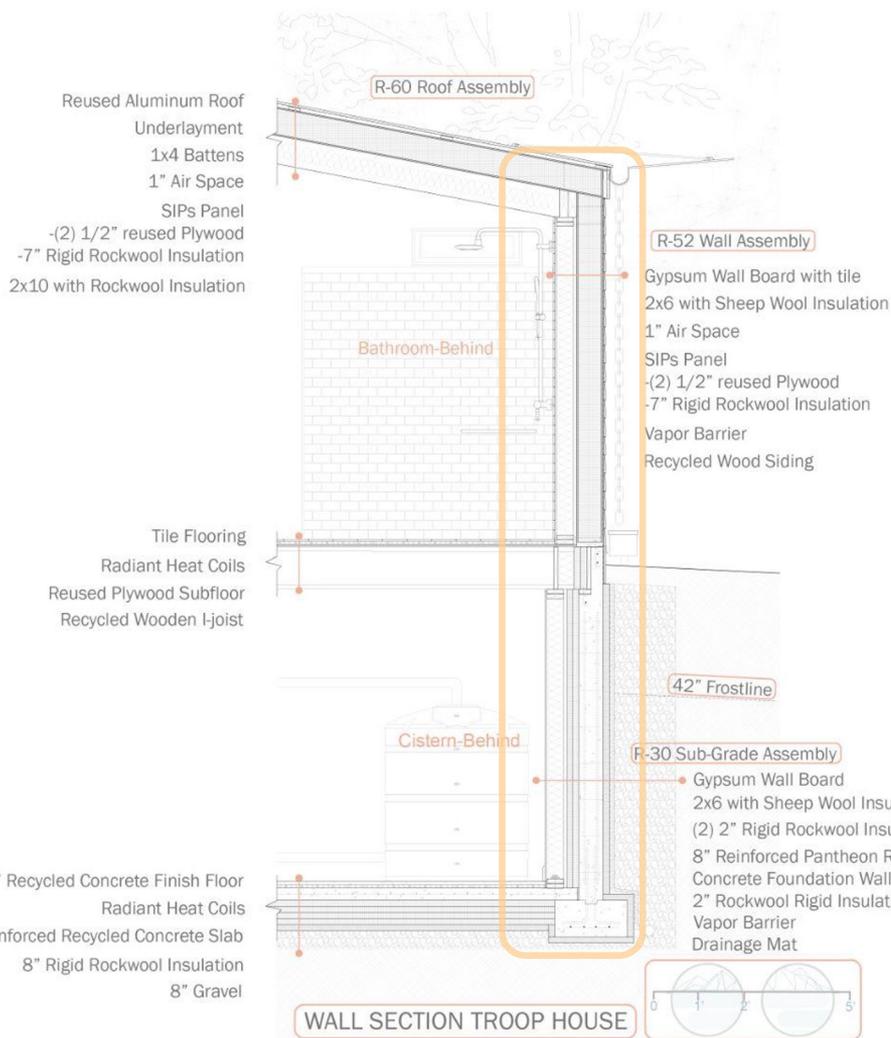
- Wall: R-52
- Floor: R-80
- Roof: R-60

ACCESSORY INSULATION

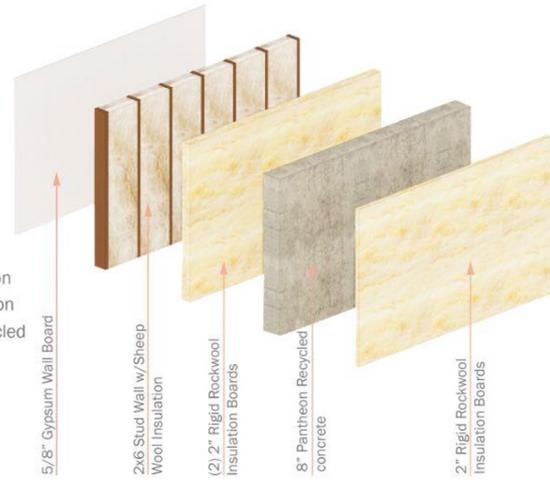
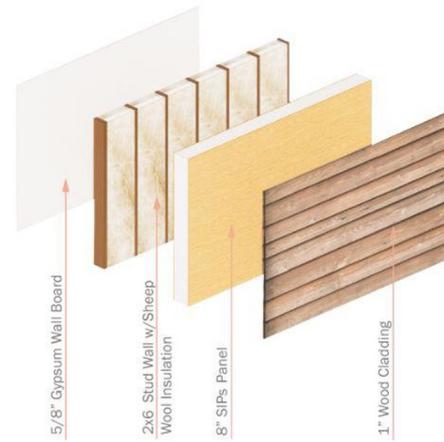
- Roof Garden
- Mass Cabinet Wall
- Shutters
- Nana Wall + Curtain

CABIN SECTION





WALL SECTION TROOP HOUSE



DURABILITY & RESILIENCE

0%

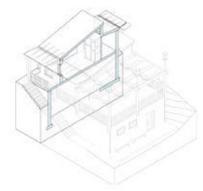
ONSITE FOSSIL FUEL

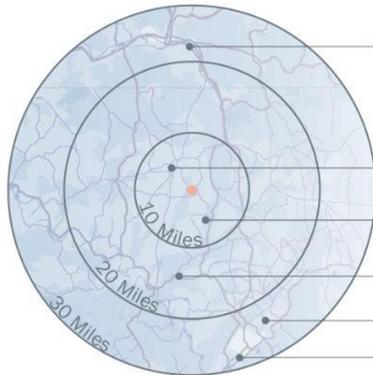
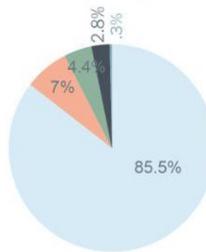
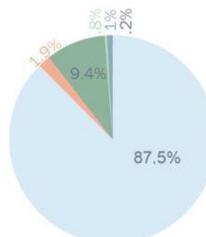
INSULATION VALUES

- Roof: R-60
- Wall: R-52
- Sub-grade Wall: R-30

ACCESSORY INSULATION

- Insulated shutters
- Rockwool Encapsulated Foundation





FLOATING CABIN EMBODIED CARBON

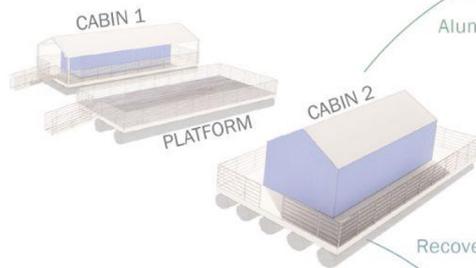
- A1-A3 Materials
- A4 Transport
- A5 Construction
- C4 Waste Disposal
- C3 Waste Processing
- C2 Waste Transport

TROOP HOUSE EMBODIED CARBON

- A1-A3 Materials
- A4 Transport
- A5 Construction
- C4 Waste Disposal
- C3 Waste Processing
- C2 Waste Transport



Existing Conditions



Recycle
Low Grade Lumber
Aluminum

Recovered Structural Aluminum

- Refurbished Pontoon Systems
- Reclaimed Wood
- Recovered Sheet Metal
- Salvaged Steel Tubing

Glacier Jane



MATERIAL LIFE CYCLE

ENVIRONMENTAL IMPACT

80%

MATERIALS RECYCLED

RESPONSIBLE SOURCING + USAGE

- Reuse :
- Lowers carbon footprint + cost
- Sourcing Local
- Lowers transportation emissions

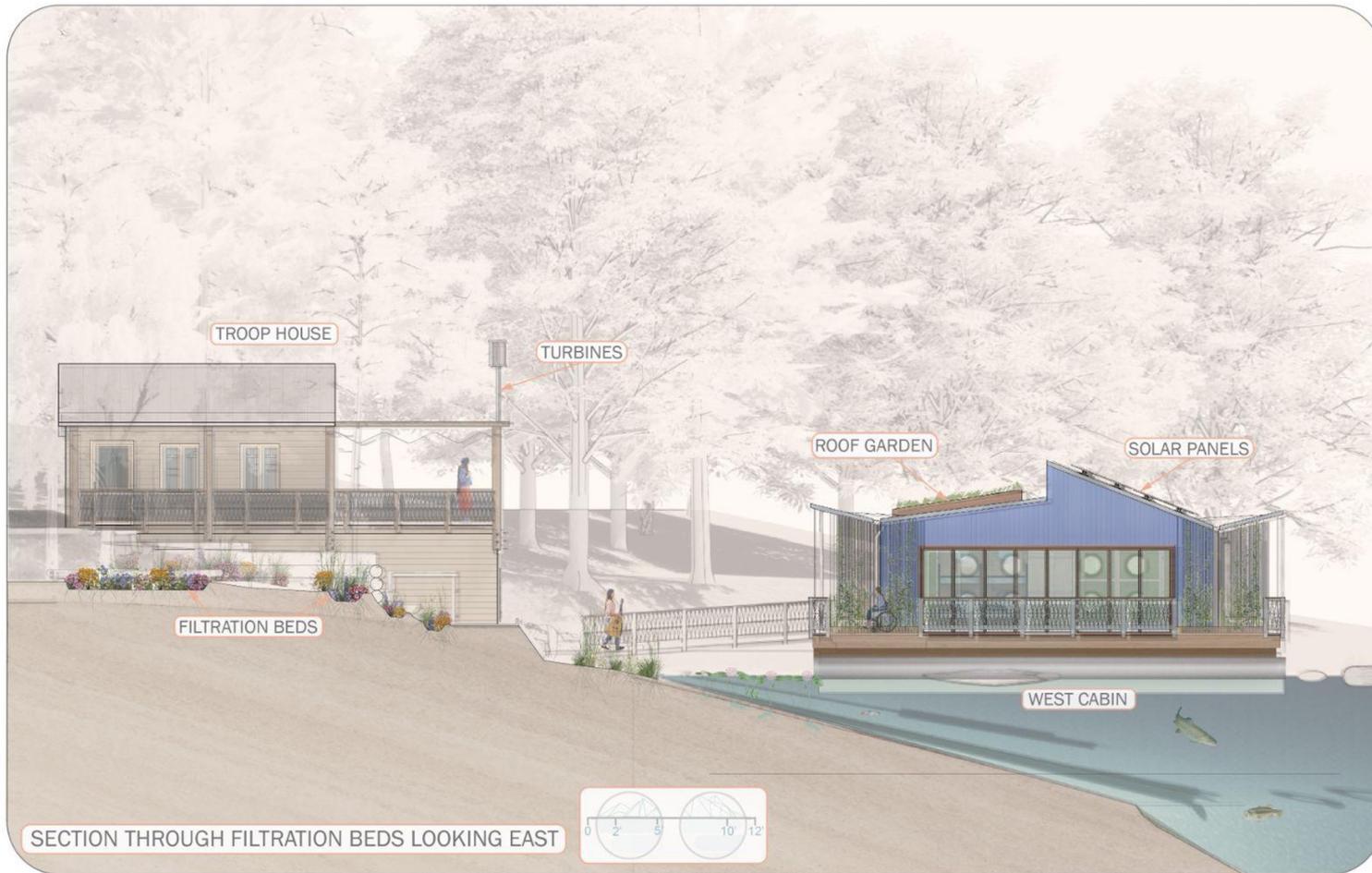
COMMUNITY INVOLVEMENT

- Builds network
- Encourages education sharing
- Improves local economy

CRADLE - TO - GRAVE

- Troop House 200kgCO₂e/m²
- Floating Cabins 54kgCO₂e/m²





SECTION THROUGH FILTRATION BEDS LOOKING EAST

ENVIRONMENTAL IMPACT



26,208 kWh



ANNUAL GENERATION - WIND TURBINES



RIPARIAN REPAIR

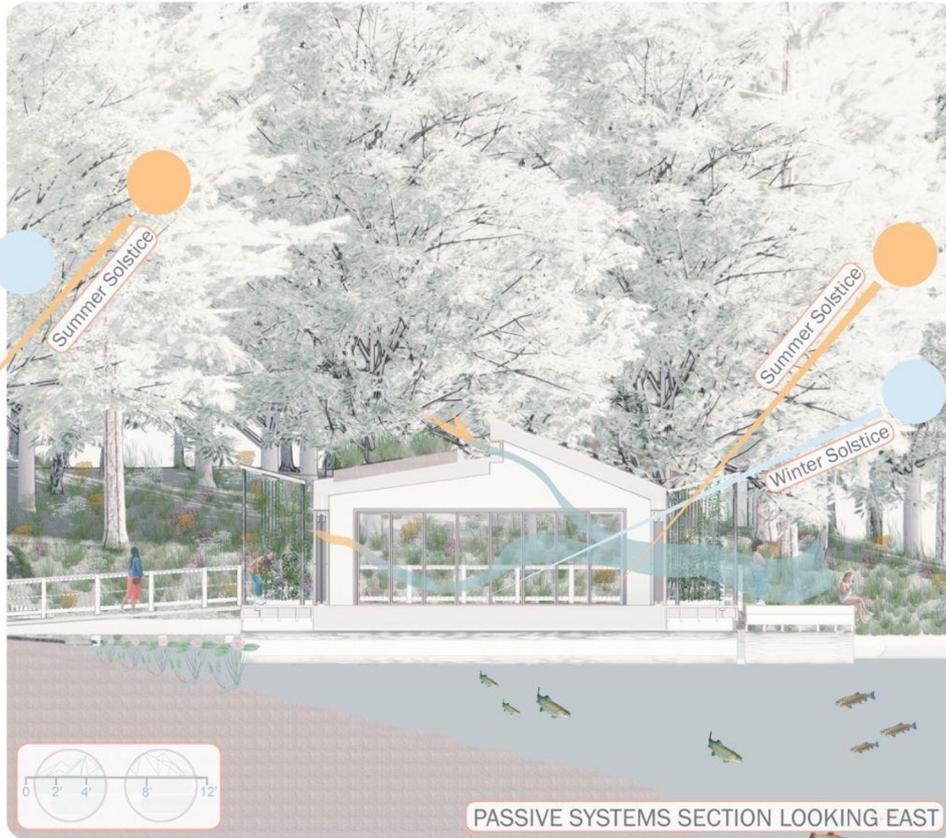
- Reduced shadowing in Riparian Zone
- Storm water filtration to mitigate acidic and nitric water



SHED ROOF DESIGN

- Provides stack ventilation access
- Ideal PV positioning
- Water collection for hydroponics
- Turbines ideally positioned for lake winds





PASSIVE SYSTEMS SECTION LOOKING EAST

INTEGRATED PERFORMANCE

91

COMFORTABLE DAYS PER YEAR

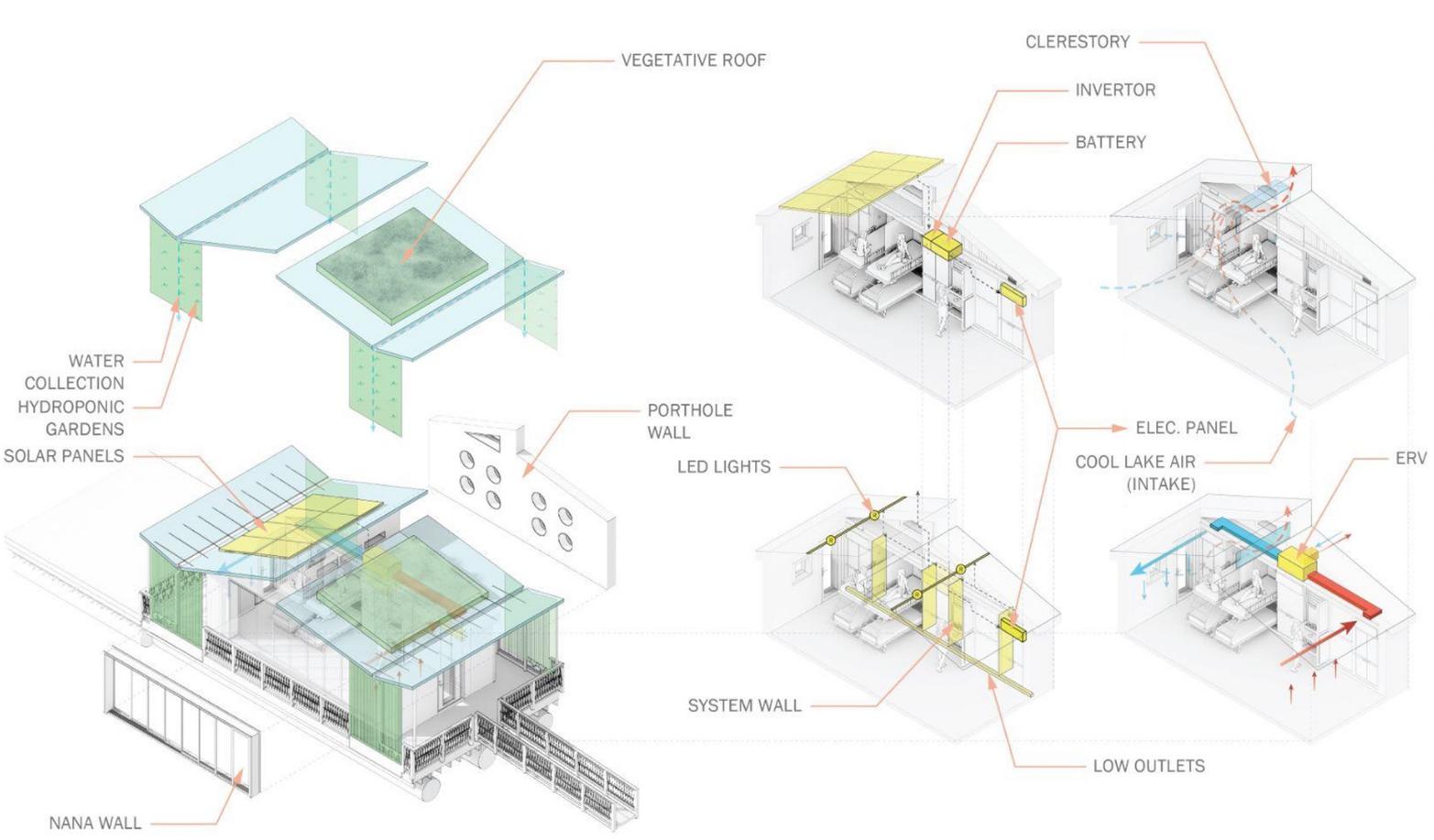
TEMPERATURE CONTROL

- Operable awnings
- Insulated Shutters
- Operable Stack & Cross Ventilation
- Nana Wall 647 with Hybrid sill

ENVIRONMENTAL QUALITY

- Daylight optimized
- HDD: 5,272
- CDD: 828





COMBINED SYSTEMS

ENERGY & VENTILATION

INTEGRATED PERFORMANCE

276
ft²

FLOATING CABIN

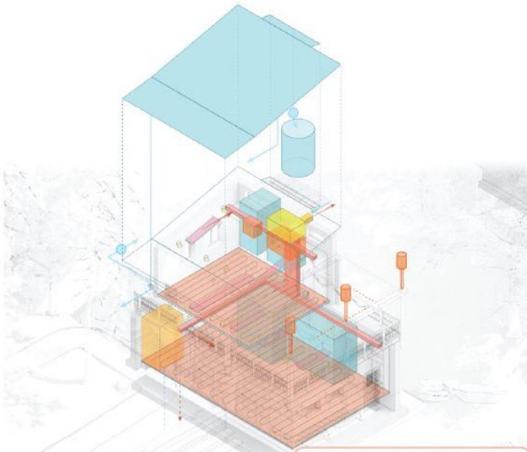
MECHANICAL

- System synchronization for max efficiencies
- Seamless integration of Passive + Active

ELECTRICAL

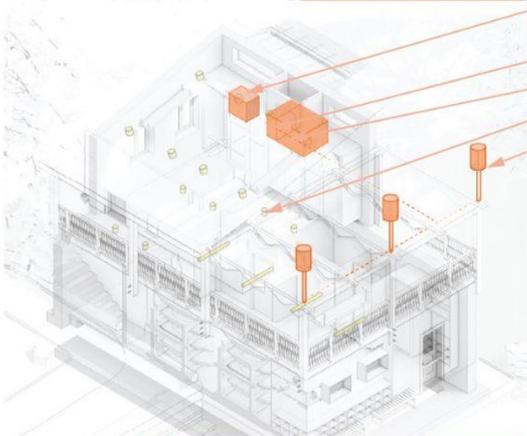
- Battery rated to hold 1 week's energy consumption
- PV System sized 20% higher than max calculated usage
- Future Proofing





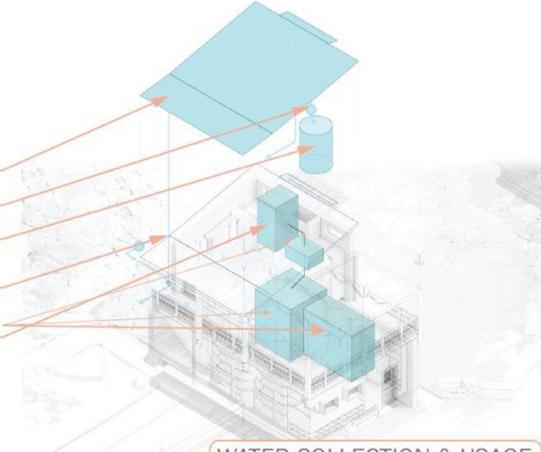
COMBINED SYSTEMS

- ROOF RAINWATER COLLECTION
- RAINWATER FILTRATION SYSTEM
- RAINWATER COLLECTION SYSTEM & CISTERN STORAGE
- RAIN CHAIN & DISTRIBUTION TO RAIN GARDENS
- RAINWATER FILTRATION SYSTEM

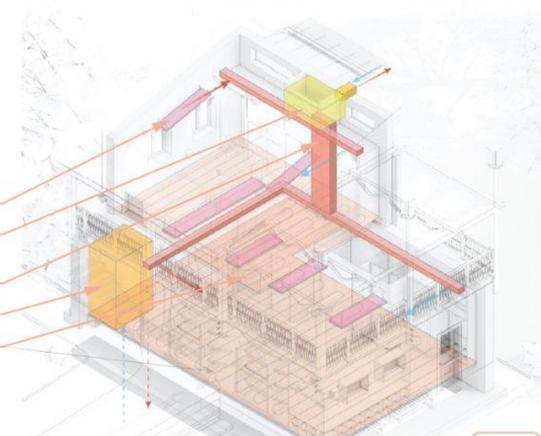


ELECTRICAL USAGE & GENERATION

- ELECTRIC BATTERY STORAGE & ELECTRIC PANEL
- DC INVERTER
- BATTERY (ENERGY STORAGE)
- BUILDING LIGHTING (SEE PLAN)
- VERTICAL TURBINES FOR ENERGY PRODUCTION
- CHILLED BEAMS
- ENERGY RECOVERY VENTILATION (ERV) SYSTEM
- (ERV) DISTRIBUTION SYSTEM
- GEO THERMAL SYSTEM
- RADIANT FLOOR HEATING



WATER COLLECTION & USAGE



HVAC

INTEGRATED PERFORMANCE

922 ft²

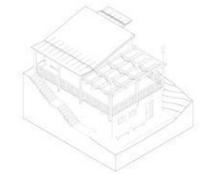
TROOP HOUSE

PLUMBING

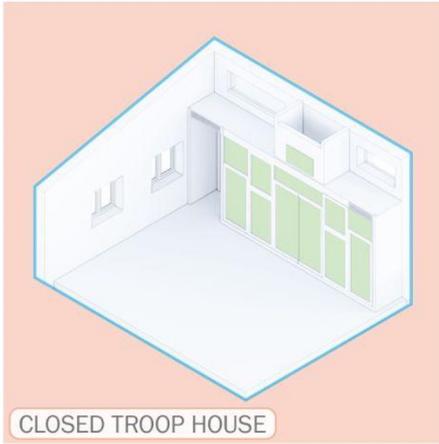
- Rainwater Collection
- Composting toilets eliminate black water
- Low-Flow fixtures for efficiency

ELECTRICAL

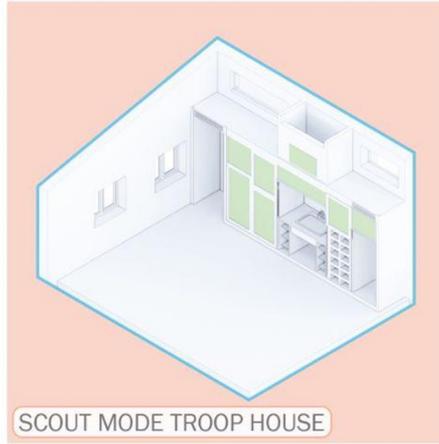
- Eliminate overhead wires by being mutually independent
- Each dwelling operates autonomously



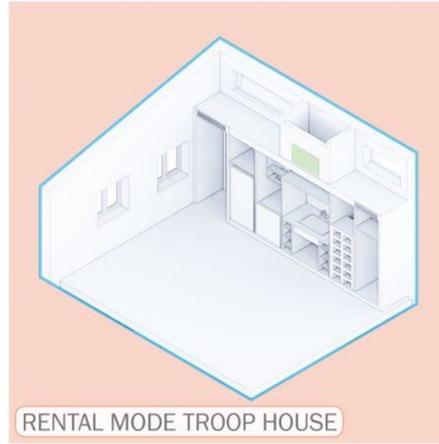
TROOP HOUSE M.E.P.



CLOSED TROOP HOUSE



SCOUT MODE TROOP HOUSE



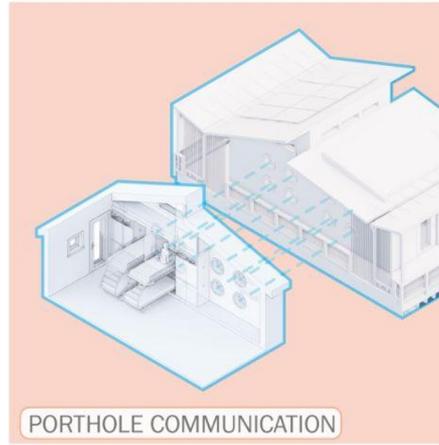
RENTAL MODE TROOP HOUSE



CLOSED CABIN



ACTIVE CABIN



PORTHOLE COMMUNICATION

OCCUPANT EXPERIENCE



5

MODES OF USE

LIVING LAB WALL

- Troop House
- Floating Cabins
- Education on Control Systems

TARGET MARKETS

- Girl Scouts
- Private Rentals

TEACHABLE MOMENTS

- Energy Saving Initiatives
- Combining Technology and Environment
- Educational UI Displays





TROOP HOUSE OVERLOOK



TROOP HOUSE INTERIOR



FLOATING CABIN INTERIOR



SNOW DAY

OCCUPANT EXPERIENCE



16 occupants



"SCOUT WRITES INTERESTINGLY ABOUT LIFE AT CAMP"



JANE JACOBS (1928)



"Some of it is woodland; soft evergreen woods, fragrant with the smell of hemlock and yew, while tiny streams sparkle and dance beneath the branches."



The remainder consists of beautiful green fields dotted with yarrow, buttercups, daisies, and dozens of other flowers. In the tall grass are fascinating grasshoppers."



RENDERS



COMFORT & QUALITY



73°

AVG. TEMPERATURE

HABITAT

- Research + Record

ACCESS

- Ease of Portability

EDUCATION

- Ready to be programmed tech
- Customizable

USER INTERFACE





COMFORT & QUALITY



5,272



HEATING DEGREE DAYS



HABITAT

- Research + Record



ACCESS

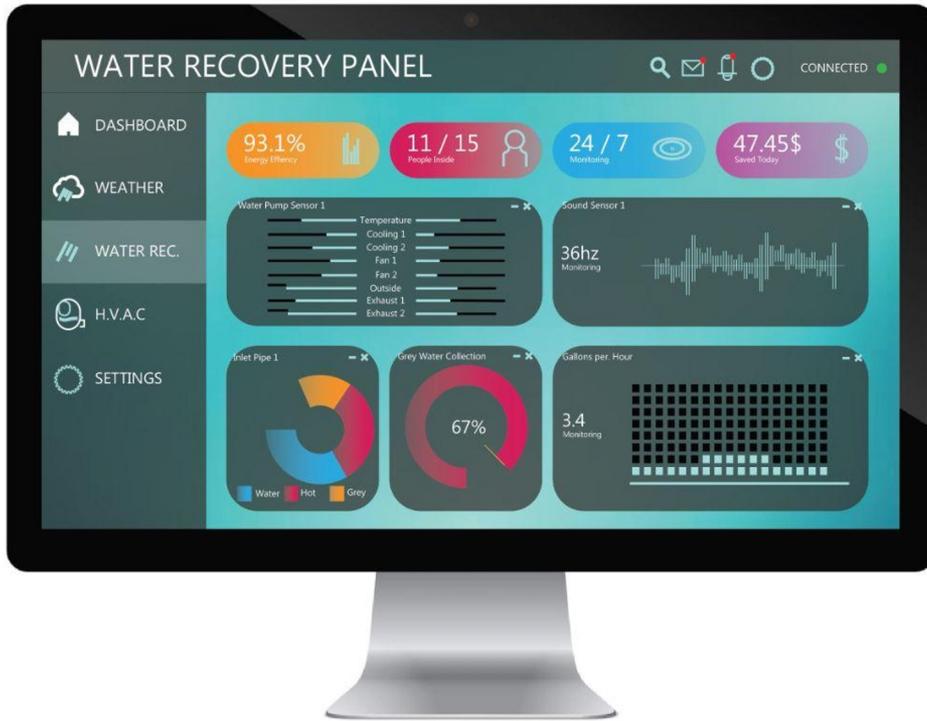
- Ease of Portability



EDUCATION

- Ready to be programmed tech
- Customizable





COMFORT & QUALITY



100 gal



CISTERN STORAGE



HABITAT

- Research + Record



ACCESS

- Ease of Portability

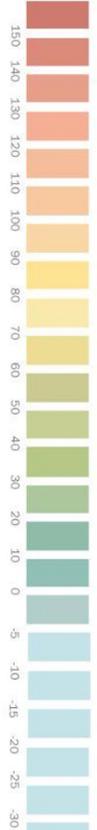


EDUCATION

- Ready to be programmed tech
- Customizable



Higher Energy Costs



140 Typical Existing Home

100 Typical New Home

27 Glacier Jane w/o PV Systems

0 Zero Energy Home

-30 Glacier Jane w/PV Systems

Lower Energy Costs

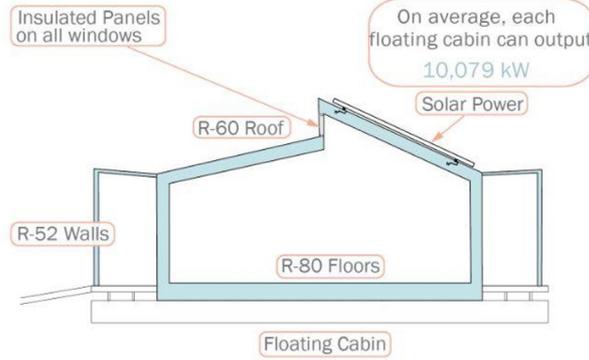
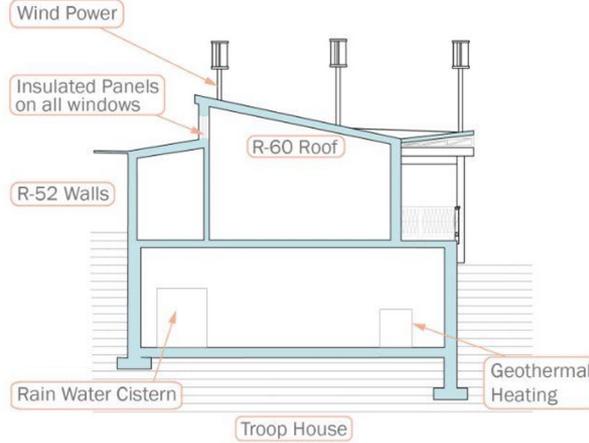
PVWatts Monthly PV Performance Data

Camp Archbald	(unit)	
Latitude	DD	41.77
Longitude	DD	-75.82
Elevation	m	415.160
DC System Size	kW	8
Module Type		Standard
Array Type		Fixed (open rack)
Array Tilt	deg	24
Array Azimuth	deg	180
System Losses	%	10
DC to AC Size Ratio		1.2
Inverter Efficiency	%	96
Ground Coverage Ratio		0.3
Albedo		From Weather File
Bifacial		No (0)

Solar Data for the panels on the floating cabins
Data provided by pvwatts.nrel.gov

Month	Solar Radiation (unit)	AC Energy (kW)
January	2.67	591
February	3.58	705
March	4.45	922
April	5.00	967
May	5.48	1,053
June	5.67	1,033
July	6.01	1,123
August	5.66	1,066
September	4.75	883
October	3.47	687
November	2.63	536
December	2.35	513
Annual Total	4.31	10,079

Average amount of solar radiation harvested from sun and output in kilowatts



RENEWABLE SOURCES & ENVELOPE

ENERGY PERFORMANCE



HERS SCORES

TOTAL RATING

THERMAL ENVELOPE

- Walls : R-52
- Ceiling: R-60
- Floors: R-80
- Windows: U-0.24
 - Shutters: U-0.13
- Doors: R-4.5

PASSIVE SYSTEMS

- Cross Wind
- Stack Ventilation
- Night Flushing
- Daylighting

RENEWABLE SOURCES

- PV Array
- Wind Turbines
- Geothermal Loop

ACTIVE SYSTEMS

- ERV





GLACIER JANE
MARYWOOD UNIVERSITY OF SUSTAINABLE CHALLENGE

M Marywood
UNIVERSITY



CENTER FOR
THE LIVING CITY